

TECH TIPS

Check Bolts For Stretch

Believe it or not bolts do stretch, many times a bolt will give the illusion of torquing to spec but it is actually bottomed out in the threads or locking up due to poor fit. The simplest way to check this is to get a standard none locking type nut and thread it on with your fingers. The nut should go on with out fighting or sticking. If it fights check the threads, although hard to see they will have an hourglass look to them. This bolt will have to be replaced. Be sure to get the same length and grade bolt. Failure to get a weaker bolt can cause a catastrophic failure.

Make Sure Bearings Are Fully Seated

Before installing bearings and races inspect bearing bores for damage. Many times with out even noticing there is damage from driving out the races. Be sure to grind down all raised surfaces no matter how irrelevant you think they are. Make sure you fully press all bearing down till they fully seated. Failing to seat the bearings and races properly will give you incorrect pinion depth and preload readings. Worse yet once you set it up and get that perfect pattern, as soon as you put power to the differential everything changes once the bearing is seated. Don't be in a rush to finish not paying attention to details like this can cost you more aggravation in the long run.



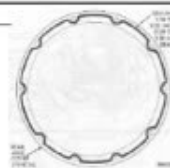
Ford TTB IFS Front Axles

When installing a aftermarket differential on Ford vehicles equipped with a Twin Traction Beam Independent Axle you may need to make a minor modification to your passenger side axle assembly to accommodate a differential that doesn't have a C Clip provision. This modification will require you to acquire a small spring from either a engine shop or hardware store. Start by marking the shafts so you know how there were orientated, remove the dust boot and pull the axle apart. If equipped with a plus at the end of the yoke punch it out and discard it. Insert the spring and reassemble the axle. When assembled ensure that the spring holds the inner axle firmly against the cross pin of the differential.



Proper Use Of Silicone

GO EASY WITH IT!!!! One of the easiest ways to ruin all your hard work and expensive parts is to be overzealous with the silicone. All you ever need is a 1/16" bead to the inside of the bolt holes on your differential cover to seal it with out a gasket. If you are using a gasket and silicone you only need to add a super thin film of silicone to both sides of the gasket. By using too much it will squish out on the inside of the differential and over time it will break off and get lodged in the bearings and lock them up. On a seal you only need a thin film as well.



Pinion Depth Tools

Most people are unwilling to spend the money to buy a proper pinion depth tools. It seems that most tools only work on 1 of 2 axles only and you will need to buy a collection of different tools to do just one truck. A lot of people will try using the flats of the bearing cap as point of reference to measure pinion depth from. Although this is fairly close it is not totally accurate. This point of measure can still be .005-.010 off due to machining tolerances.

When the housing is machined the flats are machined then the bearing journal is machined. The journal can be machined slightly off centerline of the flats. The proper way to measure is with a tool that sits in the bearing saddles and measures off the true center. The pattern method is a little more time consuming but equally effective in achieving a proper pattern. Many gear manufactures have even stopped putting pinion depth markings on their gears. This has made pinion depth tools all but useless.



9" Case Clearance

Many times on the Ford 9 inch the ring gear will contact the pinion pilot bearing support housing depending what gear ratio you are using. Many gear manufactures cut a bevel on the inside of the ring gear to clear the housing. Ford cut a small notch in the case on housing that came with 4.10 gears and lower. If your case is a high gear case additional clearance will be necessary even with the cut gears. Be very careful when grinding that you do not make the case thinner than 1/8 inch or it will crack. Use the ring gear mounted on the carrier with no pinion installed to help mark the case. Simply spin the ring gear by hand and move it over using the spanners until it contacts the case. You will know have a guide of were to grind. If excessive clearance is required it would be better to have the gear machined. Be sure to blend the notch nicely leaving no sharp edges and clean the case thoroughly before assembly.



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Cross Pin Clearance

On Many differential that require removal of cross pin to insert axle shafts we run into a problem with the cross pin hitting the ring gear when we go to some lower gears. On these applications we can get away with simply grinding a small amount of material off the opposing gear tooth. This will not affect the integrity of the gear. When you achieve a proper gear pattern you will not even use that portion of the gear. On other gear sets that are really low you may not be able to grind enough gear away to clear there are special modified cross pins. These pins are not recommended in all but in extreme cases as they are weaker and have been known to fail on occasion.



Spare The Lock-Tite

Thread locking compounds are a good thing if used in moderation. Using excessive amounts make a mess and once dried will dry to a crystal like material, which can lock up bearings. Using the correct type in the correct place is important as well. The Red is meant to be a permanent locking which will sometimes require heat to break loose. This is good for ring gear bolts and pinion nuts. The Blue is semi permanent and is good for carrier cap bolts and cross pin retainer bolts. The green is made for penetrating and is good for bearing races but rarely found. The key to using these adhesives (yes Adhesives) is that the threads must be clean and dry. Use brake cleaner or quick start to insure a clean surface. If its not clean the adhesive will not work and you wasted your time and money on it.

Set Up Bearings

Set up bearings are a useful tool for those that are starting from scratch with no previous shims to reference off. In a differential that has shims under the bearings, you will have to press the bearings on and off each time you need to make a change. This can be a real inconvenience if you have to run to the machine shop each time to get the bearings pressed. Another potential problem with pressing the bearings is that sometimes they get damaged easily. Set up bearings are a special bearing that has little to no press fit and can be removed by hand.

Pinion hits Carrier

On a number of differential there have been design changes for on reason or another that are not spoken about. On some differential when an aftermarket locker is installed there is limited space and may interfere with the pinion. This problem is easily corrected by removing a small amount of material off the tip of the pinion head. This will not affect the integrity of the gear. When you achieve a proper gear pattern you will not even use that portion of the gear.



Paint The Inside?

You will see a lot of shops painting the inside of a differential and think why bother nobody ever sees it? While the paint may look good it serves another function. When a differential experiences a failure it produces extremely fine metal fragments like dust. Even though you cleaned the differential out these particles sit in the pores of the casting and get released when the metal heats up contamination the new oil. That is part of the reason that it is so important to change the oil after break in. The use of epoxy paint will seal all the particles under the paint preventing the oil contamination and it looks good to. It is also believed that the paint aids in oil return.

Save The Crush Sleeves

Not only are Crush Sleeves expensive and a lot of work to crush, they are also a one time use part. To save money and speed up the set up operation don't use the sleeve until you have established your shim settings. If you crush the sleeve and then add pinion shim the crush sleeve is useless and will need to be replaced. To solve this problem leave the sleeve out and tighten the used pinion nut slowly until you get the appropriate pinion drag. You cannot leave it like this but its fine for the setup. After you have established a proper pattern disassemble the differential, clean everything again, oil the bearings and install crush sleeve for final assembly.

That Baffling Slinger Thing

On many differential they used slingers on the pinion head and baffles behind the races. These thin pieces of metal are used to help control oil flow in the differential. Many of these have been deemed irrelevant by the manufactures and are no longer available. If your axle has them reuse them. If yours has been damaged and you cannot find them you must make up the difference with pinion shim. Anything places between the bearing and the pinion adds to the total shim pack.

